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How Large are the Benefits of Emerging Market Equities?

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Abstract

We perform a comprehensive evaluation of the benefits of emerging market equities by extending previous research in four fundamental ways. The contribution of this study is that it 1) evaluates a more complete sample; 2) examines performance measures that account for asymmetric return distributions; 3) separates emerging markets by region; and 4) considers the influence that the market environment has on the benefits of emerging market investments. Our results suggest that previous research has understated the benefits associated with investing in emerging markets. We find that broad emerging market indices have relatively low downside risk, which results in Sortino ratios that are approximately twice that offered by developed markets. Furthermore, we find that Latin American countries are particularly beneficial in hedging against adverse conditions in U.S. financial markets. Overall, our findings indicate that emerging markets allow investors to achieve lower risk, higher returns, and expanded risk/return possibilities; especially during periods when developed world investors need diversification the most.

How Large are the Benefits of Emerging Market Equities?

Previous research documents a substantial benefit associated with an investment allocation that includes international equities (e.g. Solnik 1974). More recent research, however, suggests that the benefits of international investment have diminished as markets have become more integrated.[1] As a result of the relatively high level of integration between developed markets, emerging markets have increasingly become the focus of researchers and investment professionals.[2]

The purpose of this research is to expand investor understanding of the diversification benefits offered by emerging market equities. While most previous research considers emerging markets as a whole, we examine cross-country differences in the diversification benefits emerging markets offer. In addition, we consider the time-varying nature of the diversification benefits and investigate any potential links between investment benefits and changes in financial market conditions. Finally, we apply performance measures that are designed to more accurately gauge the investment benefits offered by emerging market equities.

The increased interconnectedness of the global economy, along with market liberalizations in many developing countries, has facilitated the integration of emerging and developed markets.[3] Relative to developed markets, however, emerging markets continue to display substantially more heterogeneity. Thus, the diverse nature of emerging countries provides strong motivation to evaluate the merits of emerging markets by individual country as well as via broad emerging market indices. The relative heterogeneity of emerging markets

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[1] Goetzmann, Li and Rouwenhorst (2005), Chua, Kritzman and Page (2009) and Leibowitz and Bova (2009) report evidence implying a diminished benefit to international investments as they find the correlations of international equities tend to increase during periods of unusual market volatility, and further, the correlations have increased over time.

[2] See for example research by Goetzmann, Li and Rouwenhurst (2005), Eun and Lee (2010), and Conover (2011).

[3] For a thorough discussion of the changes in emerging market investments from liberalization, see Bekaert and Harvey (2003).

indicates that emerging markets are driven by unique factors, which implies that the investment benefits of emerging markets may vary across country and across economic conditions. The majority of research on emerging markets has ignored potential variation in emerging market investment benefits. One notable exception, Conover, Jensen and Johnson (2002) specifically consider the possibility that the investment benefits of emerging markets are conditional on the existing market environment. Specifically, the authors identify a strong link between the diversification benefits of emerging markets and U.S. monetary conditions. The authors, however, do not examine whether the benefits vary across emerging markets.

We extend the existing research on emerging markets and provide the following specific contributions. First, relative to our research, most emerging market research relies on a dataset that includes fewer countries and a considerably shorter time series. We use 35 years of data for 20 different emerging countries ending in December 2010. Our analysis spans over three decades and encompasses much of the recent financial crisis as well as the intensified market liberalization that has occurred during the last 15 years. The large sample helps to establish the robustness of our analysis and increases the confidence that can be applied to our findings.

Second, our study mitigates the upward return bias present in many emerging market studies.[4] Many past evaluations of the investment benefits garnered from emerging markets examine data only for countries in existence at that point in time (i.e., they evaluate only the survivors, which are likely to have higher returns). To avoid survivorship bias, we examine the same 20 countries as in Conover, Jensen, and Johnson (2002). This results in the inclusion of two countries, Venezuela and Zimbabwe, that now have limited investability for global investors; the inclusion of Argentina, which has been demoted to frontier market status by

[4] For a discussion of the biases in examining the performance of emerging markets, see Tokat and Wicas (2004).

several index providers;[5] and the exclusion of countries such as the Czech Republic and Russia that have been promoted to emerging indices in recent years.

Third, given the potential for non-normal return distributions, we provide an examination of emerging equity performance using measures that account for both symmetric return distributions (standard deviation and Sharpe ratio) and asymmetric return distributions (downside deviation and Sortino ratio). If emerging market returns are skewed and possess excess kurtosis, then the standard measures of performance may lead to an inaccurate assessment of the investment benefits achieved from an emerging markets investment.

Fourth, we construct separate emerging market indices for Asia and Latin America in order to compare the relative benefits of investing in these regions. Given the substantial diversity in trade that occurs between developed countries and Asia versus developed countries and Latin America, it is likely that the investment benefits differ across the two regions. For example, a relatively high percentage of developed market imports from Latin America consist of commodities (raw materials), whereas developed market imports from Asia consist of a higher proportion of finished goods. Therefore, developments in the financial markets are likely to impact these equity markets differently. In particular, inflationary pressures tend to elevate raw materials prices, which can be beneficial for firms providing raw materials relative to finished goods manufacturers.

Fifth, we examine whether the diversification benefit from emerging market equities varies based on conditions in U.S. financial markets. Financial market conditions have been shown to be associated with developed world equity market return patterns such that performance weakens during periods when inflationary concerns in the U.S. are elevated.

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[5] For example, MSCI demoted Argentina to frontier status in May 2009. We include data for Venezuela and Zimbabwe until December 2006 when it is no longer reliably available from the index providers.

During such environments, Fed policy rates are generally increased in order to control inflationary pressures. It may be the case that emerging markets are sufficiently segmented such that they provide diversification benefits during these inflationary periods. The indicator of financial market conditions used in the paper is implemented on an ex-ante basis, which allows us to assess the practical implications on global portfolio performance.

Data

The sample period starts in January 1976 and ends in December 2010. Consistent with Errunza, Hogan and Hung (1999) and other studies, our primary source of emerging market return data are the Standard and Poor's/International Finance Corporation Global (IFCG) indices.[6] The IFCG indices are market-capitalization-weighted and free-float-adjusted.

We also use the individual emerging country returns to form equally-weighted and GDP-(Gross Domestic Product) weighted emerging indices.[7] The average weight of each country in the GDP-weighted index is provided in the Appendix. Brazil, India and Mexico are weighted most heavily while Jordan, Zimbabwe and Chile are weighted the least over the 35 years in our sample. In order to compare the relative benefits of investing in Latin America and Asia, we

[6] All our return data are retrieved using Datastream. Most of the returns for the emerging stock markets are proxied by the returns to the International Finance Corporation Global (IFCG) indices. Return data for emerging country indices start in January 1976 except for the following countries: Jordan starts in January 1979; Colombia, Malaysia, Nigeria, Pakistan, Philippines, Taiwan, and Venezuela start in January 1985; Turkey starts in January 1987; and Indonesia starts in January 1990. The IFCG data were originated by the International Finance Corporation and subsequently acquired by Standard and Poor's (S&P) in 2000. Starting November 2008, S&P discontinued the IFC data and replaced it with the S&P Global Broad Market Indices. We therefore use this latter data for the latter time periods in our study except for Colombia, Greece, Jordan, Nigeria, Pakistan, South Korea, Malaysia, and Venezuela for which we use Morgan Stanley Capital International (MSCI) data because a full time series of S&P data are not available for these countries via Datastream. Additionally, in April 1999, IFC data for Portugal was discontinued because the IFC "graduated" the country from the emerging markets index due to Portugal's entry into the European Monetary Union. We have IFC data for Portugal until March 1999, after which we use MSCI data. As noted previously, we include data for Venezuela and Zimbabwe until December 2006 when it is no longer reliably available from the index providers.

[7] Weights for the emerging market index are based on annual country GDPs obtained from the International Monetary Fund's *International Financial Statistics* and various editions of the *Emerging Markets Factbook*. We weight the country returns in each month using beginning of the year country GDPs. We use GDPs because market capitalizations are not available from 1975 to 1980.

construct equally-weighted indices of sample countries in each region.[8] The Latin American index is composed of Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. The Asian index includes India, Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand.[9]

We also examine the returns from several composite indices including the EAFE plus Canada (EAFEC), World, and U.S. stock indices, which are from Morgan Stanley Capital International. The EAFEC is a market-capitalization-weighted index representing the returns of developed countries in Europe, Australasia, the Far East, and Canada. The World Index is capitalization-weighted and represents returns to the U.S., Canada, and EAFE countries. All the indices include dividends in the calculation of returns. The risk-free rate is from Kenneth French's website where the risk-free rate is measured as the 1-month U.S. T-Bill return.[10]

Results

In Table, 1, we provide summary statistics for emerging markets in both U.S. dollar (USD) and local currency (LC) terms. For the mean returns, we examine the geometric mean rather than the arithmetic mean due to the high return volatility in these markets. The standard deviation of returns is also provided, along with the difference between USD and LC volatility, which Solnik and McLeavey (2009) refer to as the contribution of currency risk.

In general, the LC returns in emerging markets are quite impressive. For Argentina and Brazil, the returns are over 7% per month. In 15 of the 20 emerging countries, the LC return is substantially higher than that for the U.S. and World indices. At 3.44%, the LC return for the GDP-weighted emerging index is more than 2.5% higher than that for the World index. The loss

[8] Note that, due to the nature of our data, these indices are market-capitalization-weighted within each country and equally-weighted across countries.
[9] Other regions are not sufficiently represented to warrant separate analysis. For example, Europe and Africa include only two countries each.
[10] The website http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Research was accessed May 2, 2011.

from currency depreciation, however, is pervasive in the emerging markets and is especially prominent in some countries. In 18 of the 20 emerging countries, there is a loss to the U.S. dollar investor from the change in currency value. It approaches seven percent per month in Brazil and is over five and a half percent per month in Argentina. For the GDP-weighted emerging index, the loss is 2.08% per month, or approximately 25% on an annual basis. Compared to the currency effect of the EAFEC Index (0.14%), all 20 emerging countries have currency effects that either detract from or contribute less to a USD investment. These results highlight the importance of currency issues when investing in emerging markets. Further, the crucial role that currency values play suggests that financial market conditions are worthy of investigation when assessing the merits of emerging market equities.

Despite the weak currencies over this time period, emerging markets on average still represent an attractive investment to the U.S. dollar investor. In 14 of 20 emerging countries, the USD return is higher than that available from a global portfolio of developed markets, as represented by the World index. The equally-weighted emerging index return of 1.48% is 64 basis points higher than the World index, or about 7.7% (0.64×12) higher on an annual basis.[11] Interestingly, the highest USD return in emerging markets is not earned from an investment in a single country, but from an investment in the Latin American index, which at 1.99% is more than one percent higher than that available from any of the developed market indices. That the Latin American index return is higher than its components reflects the "diversification return" identified by Erb and Harvey (2006) and attributed by Willenbrock (2011) to the implicit rebalancing in an equally-weighted index. The strong Latin American performance in USD terms

[11] The higher USD return for the equally-weighted emerging index, relative to the GDP-weighted index, is consistent with the findings of Lamm (2011), who finds superior returns from equally weighting an emerging index, versus a cap-weighted index. He attributes the higher return to the greater diversification and lower investment in overvalued countries. Note however that the LC return ranking in the emerging indices is opposite to the USD return ranking, indicating that the higher USD returns from equal weighting are due to a currency effect.

persists despite the fact that the currency loss for the Latin American index was the greatest of any of the broad emerging or developed market indices.

Examining standard deviations, the USD risk in all 20 individual emerging countries is higher than the risk of the U.S. equity index. The same relationship is true for 19 of the 20 emerging countries when examining LC risk, with the only exception being Portugal. The risk is highest in Argentina, where the LC and USD standard deviations are 31.49% and 22.36%, respectively. Note however, that when moving from individual countries to emerging indices, the risk is substantially tempered, dropping to 5.19% and 6.19% in USD terms for the equally-weighted and GDP-weighted indices, respectively. The dramatic drop in variation is consistent with the heterogeneity, and relatively low inter-country correlation, of the emerging market countries.

Surprisingly, the contribution of currency risk is rather modest in emerging markets. Comparing the equally and GDP-weighted emerging indices to the developed EAFEC and World indices, the contribution of currency risk is considerably lower for the emerging indices. Furthermore, the contribution of currency risk is less than 1% in 15 of 20 emerging countries. It is negative in three individual markets, the GDP-weighted index, and the Latin American index; indicating a negative correlation between currency changes and LC stock returns.[12] This provides the investor with lower risk in USD terms because the currency change generally runs counter to LC equity returns. Thus, although the currency effect typically detracts from the mean return in

[12] Stock returns and currency changes have been thought to be positively correlated in emerging markets [Solnik and McLeavey (2009)], with the explanation that during crisis periods, both emerging currencies and stocks decline in value as investors lose faith in emerging countries. This is in contrast to developed countries, where the correlation between currency changes and stock returns is typically negative, because a depreciating currency makes the country's exports less expensive to foreign consumers. When currencies depreciate, exporters' earnings and stock prices increase. Currency and stock risk therefore often offset one another, reducing the risk to a foreign investor. More recent research suggests that the relationship between currency changes and stock prices in emerging markets has changed. Chue and Cook (2008) find that in recent periods, stock prices increase when the currency declines, as in developed markets.

emerging markets, the USD volatility is not greatly affected by currency risk due to low or negative correlations between the currency changes and LC stock returns.

In Table 2, we present additional performance statistics for the emerging indices. In the first column we present Sharpe ratios. Interestingly, only 10 of the 20 individual emerging market Sharpe ratios are both positive and significantly different from zero.[13] The Sharpe ratio for Portugal is negative and significant. In 11 of the 20 countries, the Sharpe ratio is less than that for the World index. However, the Sharpe ratios for all the aggregate emerging indices are positive, significant, and greater than those reported for the developed market indices.

Although the Sharpe ratios for the individual emerging markets are often lower than the ratios reported for the developed markets, the ratios do not tell the whole story of emerging markets in a global portfolio context. To determine whether developed and emerging markets are an attractive portfolio addition, Elton, Gruber, Brown, and Goetzmann (2009) and Sharpe, Chen, Pinto, and McLeavey (2007) utilize a measure that incorporates the Sharpe ratio for the current portfolio, the Sharpe ratio for a potential addition, and the correlation between the two. The measure indicates it is optimal to add a new asset to the portfolio as long as:

$$\frac{E(R_{new})-R_F}{\sigma_{new}} > \left(\frac{E(R_P)-R_F}{\sigma_P}\right) \mathrm{Corr}(R_{new},R_P). \qquad (1)$$

The term on the left is the Sharpe ratio for the potential addition to the portfolio, where the expected return, $E(R_{new})$, minus the risk-free rate (R_F) is divided by the asset standard deviation (σ_{new}). The term on the right (referred to here as the comparison statistic) is the Sharpe ratio for the current portfolio (P) multiplied by the correlation between the potential addition and the current portfolio.

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[13] To determine significance for the Sharpe ratio, we use the standard error of $1/\sqrt{N}$, where N is the number of monthly observations [see Grinold and Kahn (2000)].

We apply Equation 1 to our sample of emerging market returns, assuming that the current portfolio is the World index. The analysis evaluates each emerging market index to determine whether the emerging market provides a marginal benefit to the well-diversified developed global portfolio, thereby improving the equity investor's portfolio of risky assets. We report the comparison statistic in the third column of the table.

For 18 of the 20 countries, the country Sharpe ratio is greater than the comparison statistic, indicating that adding the country equity index would improve the mean-variance efficiency of the World index. The only countries that do not improve a developed-world portfolio are Greece and Portugal. Examining the aggregate emerging market indices, both equally-weighted and GDP-weighted indices, as well as Asian and Latin American indices, offer a substantial benefit as an addition to a developed-world portfolio.

Another method of examining the attractiveness of emerging markets is to rearrange Equation 1, as in Elton, Gruber, Brown, and Goetzmann (2009). An advantage of this alternative approach is that it allows us to derive a measure of the excess return the security offers if it were added to the portfolio. When Equation 1 is rearranged, the resulting expression states that an asset should be added to an existing portfolio as long as its excess return (the asset return minus the risk-free rate) is greater than the expression on the right hand side below:

$$E(R_{new}) - R_F > [E(R_P) - R_F]\left[\frac{\sigma_{new}Corr(R_{new},R_P)}{\sigma_P}\right] . \qquad (2)$$

The term on the right hand side provides the minimum risk premium that would warrant the addition of an emerging market to the portfolio.[14] The formula incorporates both the risk and correlation of the emerging market and indicates that lower emerging market standard deviations

[14] As Elton, Gruber, Brown, and Goetzmann (2006) note, the term in brackets on the right hand side is equivalent to the beta for the new asset with the current (World) portfolio. This can be seen by multiplying the numerator and denominator by standard deviation for the current (World) portfolio.

and correlations result in lower minimum returns. Although many investors shun emerging markets due to their higher standard deviations, their low correlations may sufficiently mitigate their higher stand-alone risk.

The difference between the term on the left hand side and the right hand side of Equation 2 is referred to as the return premium; column 3 of Table 2 reports the return premium relative to the World index. The return premium indicates whether the relatively high returns and low correlations offered by emerging markets are sufficient to mitigate their relatively high stand-alone risk. The evidence indicates that emerging markets overwhelming pass this test as the return premium is positive for 18 of the 20 countries.[15] Furthermore, for seven of the 20 emerging countries, the return premium is substantial as it registers above 1%. For the Latin American emerging index, the monthly return premium is 151 basis points or 18.12% on an annual basis, which is more than twice that for the Asian emerging index (60 basis points monthly). For the equally-weighted and GDP-weighted emerging indices, the smallest return premium is 71 basis points or about 8.5% annually. The prevalence of positive return premiums indicates that the attractive returns and low correlations offered by emerging markets more than compensate for their relatively high stand-alone risk. Thus, the evidence supports the claim that emerging markets are an attractive addition to a well-diversified developed market portfolio.

We repeat the return premium calculation in the last column of the table, using the U.S. index return as the current portfolio, rather than the World index. This allows a view of emerging markets from the perspective of a U.S. investor who has not yet diversified internationally. Furthermore, use of the U.S. index allows a comparison of the benefits achieved by a U.S.

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[15] To maintain consistency with equation 1 and the Sharpe ratios in Table 2, we use the arithmetic mean (not reported separately) to calculate the return premiums.

investor from investing in emerging markets relative to an investment in the EAFEC.[16] Consistent with the results for the World index, the return premiums are negative for only two countries, Greece and Portugal. Interestingly, the benefits of adding the EAFEC to a well-diversified U.S. portfolio are meager when compared to the benefits achieved from adding any of the broad emerging markets indices. Specifically, the return premium associated with the EAFEC is only 0.16% versus 0.88% and 0.74% for the equally-weighted and GDP-weighted emerging markets indices, respectively. The return premium for the Latin American index is an astounding 1.53%, which is more than twice that of the Asian index. This finding supports the contention that these two regions merit separate consideration when evaluating the benefits of emerging market equities.

In Table 3, we report the correlations between the country indices and the World and U.S. indices. The correlations for the individual emerging markets relative to the World index are quite low, with the maximum being 0.46 for Portugal. For 14 of the 20 countries, the correlation is less than 0.40. For both the equal-weight and GDP-weight index, the correlation is 0.56. The correlations between emerging markets and the U.S. index are even lower than those reported relative to the World index. For 16 of the 20 individual markets, the correlation with the U.S. market is lower than that with the World index, which indicates that for U.S. investors who have not diversified internationally emerging markets offer particularly attractive diversification opportunities.

Previous research indicates that emerging market returns are often non-normally distributed. For our data, there is a positive skew in 17 of the 20 emerging markets and excess kurtosis in all markets so that the Jarque-Bera test indicates a non-normal distribution of returns

[16] This is not possible when the World index is used as the current portfolio because the EAFEC is already a large part of the investor's portfolio.

in all 20 emerging markets.[17] Under these conditions, standard deviation may not accurately represent the risk of these markets because it penalizes large positive returns. Therefore, in Table 3 we utilize the downside deviation as an alternative measure of risk, as specified in Feibel (2003)[18]:

$$\text{Downside Deviation} = \sqrt{\frac{\sum_{i=1}^{N}(R_i - T_i)^2 \text{ where } R_i < T_i}{N}} \qquad (3)$$

In equation 3, N is the total number of monthly return observations (R) for each index. We use the U.S. risk-free rate in each period as the target minimum return (T) and accordingly also report the excess return for each market.[19] The advantage of the downside deviation is that it does not measure the dispersion of all returns, but only those below the specified target return.

As an additional measure of emerging market investment performance, we also report the Sortino ratio in Table 3, specified as the difference between the mean portfolio return ($\bar{R}$) and target return ($\bar{T}$) divided by the downside deviation:

$$\text{Sortino Ratio} = \frac{(\bar{R} - \bar{T})}{\text{Downside Deviation}} \qquad (4)$$

The USD excess return ($\bar{R} - \bar{T}$) in 18 of 20 emerging markets is higher than that available from the U.S. or World indices. It is negative in only one market, Portugal. Whereas the developed market indices of the U.S., EAFEC, and World provide an average excess return of about 50 basis points, both GDP and equally-weighted emerging indices provide an excess return approximately twice as large. The performance in Latin America is again remarkable, with an annual excess return of over 22% (1.85×12).

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[17] The skewness, kurtosis, and Jarque-Bera statistics are not reported here but are available upon request.
[18] The downside deviation used here is sometimes referred to as the target semi-standard deviation.
[19] Consistent with the calculation of the Sortino ratio, we present the excess return as an arithmetic mean.

Recall from Table 1 that the standard deviation of USD returns for the equally-weighted and GDP-weighted emerging indices was 5.19% and 6.19%, respectively, versus 4.43% in the U.S. However, when we examine downside deviation in Table 3, the values for the equally-weighted and GDP-weighted indices are 3.29% and 3.96%, respectively, which are comparable to the 3.05% downside deviation for the U.S. Thus, when risk is measured only in downside terms, the gap between the emerging indices and the U.S. is notably lower, which implies that much of the risk in emerging markets is upside risk. This again contradicts the common notion that emerging markets have dangerous levels of risk for developed market investors.

Lastly in Table 3, we evaluate excess returns relative to downside risk as represented by the Sortino ratio. We again contrast the performance for emerging countries in Table 3 against that in Table 2, where total risk was used in the performance measure. In Table 2, only 8 of 20 emerging countries outperformed the World index as measured by the Sharpe ratio. Using the Sortino ratio in Table 3, 14 emerging countries had a higher value than the World index. These same 14 emerging countries also reported higher Sortino ratios than the EAFEC index. Furthermore, the Sortino ratio for the equally-weighted emerging index at 0.36 is more than twice that available from any of the three developed market indices, where the highest ratio is 0.17 for the U.S.

Overall, the findings reported in Tables 2 and 3 indicate that emerging market equities offer substantial benefits to investors that have previously limited their investment opportunity set to developed market equities. The benefits are due to the attractive returns offered by emerging market equities, along with the low correlations that emerging markets exhibit relative to developed markets. Interestingly, we find that the benefit U.S. equity investors achieve from an investment in foreign developed markets (the EAFEC) is meager. In contrast, the benefit

obtained from supplementing a U.S. equity portfolio with emerging market equities is substantial. Furthermore, an investment in Latin American equities is shown to offer considerably greater investment benefits than those that accrue from an investment in Asian equities. Finally, the evidence indicates that the investment benefits of emerging market equities are understated by the traditional measures of investment performance, as much of the variation in emerging market returns is due to upside variation.

As previously noted, exports from Latin American countries, relative to emerging Asian country exports, tend to be more focused on commodities. In contrast, the relative reliance on finished goods exports is greater for emerging Asian countries. Therefore, the monetary environment in developed markets, and the general level of inflationary pressures, may influence emerging equity returns differently across these two regions. Conover, Jensen and Johnson (2002) find that the performance of emerging market equities is influenced by U.S. monetary conditions; however, the authors do not separate emerging markets into separate regions. To address this issue, Table 4 reports data to determine whether fluctuations in price levels in the U.S. and the developed world have a differential impact on the emerging market returns in Asia versus Latin America.[20] Given the importance of commodities as a component of consumer prices, we expect Latin American equity returns to be more highly related to developed world inflation than Asian equity returns.

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[20] In order to isolate the different influence that financial market conditions in the U.S. have on the performance of the two emerging markets, we focus on the returns measured in local currency. We examine correlations using overlapping annual data, more specifically, the correlations are examined on a monthly basis using the sum of the current month and previous eleven months of inflation rates and stock returns. This approach is used by Gorton and Rouwenhorst (2006) who argue that asset returns are volatile relative to inflation such that long-term correlations better measure the relationship between returns and inflation. This is also consistent with Jensen and Mercer (2011) and Edwards and Liew (1999).

Table 4 contains several alternative proxies designed to identify uncertainty in price levels in the U.S. and the developed world. Two of the five indices are U.S. inflation indices whereas the others measure inflation in Europe, advanced industrial countries, and in the world in general. The evidence strongly supports the contention that price levels, monetary conditions and inflationary pressures in the U.S. and the developed world relate very differently to equity returns in emerging Asian countries relative to Latin American countries. Specifically, Latin American equities are much more strongly correlated with U.S. inflation, which is consistent with the heavier emphasis Latin American companies place on commodities as exports. The correlations between developed world inflation and Latin American equities are significantly different from zero in all cases. On the other hand, emerging Asian equities have correlations with developed world inflation that are insignificantly different from than zero in all cases, and negative in some cases. This suggests that Latin American equities behave differently than Asian equities.

The evidence reported in Table 4, strongly motivates a separate investigation of the benefits of emerging market equities by region. In particular, given the detrimental effect that an inflationary environment in the developed markets can have on developed market equity returns, the substantial cross-region differences in correlations signal significant differences are likely to exist in the diversification/hedging potential for equities from the two emerging market regions.

Jensen, Mercer and Johnson (1996) identify a single measure that they show is effective in categorizing the U.S. monetary environment into expansive and restrictive classifications. We follow Jensen, Mercer and Johnson (1996) and use changes in the direction of the Federal Reserve discount rate as an indicator of the monetary environment. According to their approach, a discount rate increase initiates a restrictive monetary environment (a period reflecting

heightened concern regarding inflationary pressures) and a rate decrease identifies the start of an expansive environment (a period where inflationary pressures are relatively subdued).

Jensen, Mercer and Johnson (1996) show that monetary aggregates and various measures of economic and banking activity expand at a significantly greater rate during periods of expansive relative to restrictive monetary policy. An important advantage of dichotomizing the Fed's broad policy stance in this manner is that changes in the Fed's policy stance are readily identifiable. For example, the change in the Fed discount rate that occurred on September 18, 2007 received considerable media attention and was widely publicized in the financial press. We measure returns subsequent to shifts in Fed policy to examine the performance of global allocation strategies that do not suffer from look-ahead bias (i.e., these strategies could have been implemented in real time). Specifically, we match stock returns with the monetary environment established in the previous month. Therefore, an investor could have used the previous month's monetary environment as a guide to the current month's portfolio allocation.

Although there have been over 100 changes in the discount rate during our sample period, only 15 of them have been in the opposite direction of the prior change (turning points). Thus, using this policy signal, the Fed has switched from an expansive policy stance to a restrictive policy stance (or vice versa) only 15 times in the 35 years of the sample. Over the sample period, there are eight expansive and eight restrictive policy phases of the monetary cycle.[21] The average duration of expansive policy phases is approximately 30 months, and the average duration of restrictive policy phases is approximately 22 months. Approximately 58% of the return observations are in periods of expansive policy, and 42% are in periods of restrictive policy. As a result, there would have been very few changes in the investor's portfolio allocations resulting from changes in the monetary environment.

[21] Our sample starts during an expansive monetary environment and ends during a restrictive monetary environment.

In Tables 5 and 6, we reexamine the analysis of Tables 2 and 3, with the data set separated into expansive (Panel A) and restrictive (Panel B) monetary environments. In each panel, the first column reports the excess return, which is the return minus the risk-free rate. The excess returns reported in Table 5 are higher in restrictive environments, relative to expansive environments, for 12 of the 20 emerging countries. Likewise, the broad equally-weighted and GDP-weighted emerging indices support this same relation; higher returns in restrictive relative to expansive monetary periods. In stark contrast, for the developed market indices, the excess returns are over twice as high in expansive relative to restrictive environments. Finally, the excess returns for the Asian index align with the developed indices (higher in expansive relative to restrictive periods), while the Latin American index performs better during restrictive periods.

We next examine Sharpe ratios so as to incorporate risk into the analysis. As expected, for the three developed market indices, the Sharpe ratios are higher during expansive U.S. monetary environments relative to restrictive environments. Furthermore, the ratios are significantly different from zero only during expansive environments. In contrast, for the individual emerging markets, the ratios are higher during restrictive environments for 11 of the 20 countries. Further, there are seven countries where the Sharpe ratio is significantly different from zero during restrictive environments, but just four where this is true during expansive environments.[22] For the two broad emerging indices, the Sharpe ratios are higher during restrictive environments and significantly different from zero in both environments. That emerging markets do not follow the developed market relationship with monetary environments reaffirms their ability to hedge adverse conditions in developed markets.

[22] In results not reported, 18 of 20 individual emerging markets are beneficial additions to a both U.S. and World portfolios, during both expansive and restrictive environments. This is also true for all broad emerging markets during both environments.

Interestingly, when the broad emerging markets are partitioned into the Asian and Latin American indices, it is only the Latin American index that runs counter to developed market patterns. Specifically, the Sharpe ratio is higher during restrictive environments for Latin American markets, but the opposite is true for the Asian markets. This result runs counter to popular thought, where it is often assumed that Latin American markets are more closely linked to U.S. policy than Asian markets. It is also inconsistent with the results from Chiang and Zheng (2009), who find investors in Latin America herd around U.S. returns more than they do their own markets.

The last two columns in each panel of Table 5 report the return premiums relative to the World and U.S. indices, respectively. Recall that the return premium considers an index's return, correlation and risk, and thus reflects the potential contribution to investment performance offered by the index. The evidence indicates that emerging markets are attractive additions to developed market portfolios in both expansive and restrictive monetary periods as the return premiums are positive for 18 of 20 individual emerging countries in each environment. The broad emerging market indices confirm this result as the return premiums are prominent in all four cases, ranging from a low of 0.42% to a high of 1.90%.

Although the results in Table 5 support the general benefits offered by emerging markets, there are several findings that suggest the benefits vary systematically across region and across monetary environment. First, the benefits of emerging markets are substantially larger during restrictive periods relative to expansive periods. In particular, the return premiums for the broad emerging market indices are more than twice as high during restrictive conditions. For example, the return premium associated with adding the GDP-weighted emerging index to the U.S. index is 0.47% during expansive periods, but is an impressive 1.03% during restrictive periods.

Second, the difference in return premiums across monetary environment is driven by the Latin American countries. The return premiums for the Asian index display almost no variation relative to the monetary environment or the developed market index, with three of the four values equaling 0.58%. In contrast, relative to the Asian index, the Latin American index offers a considerably higher return premium and more cross-environment variation. Specifically, the return premium for the Latin American index averages about 1.2% during expansive conditions and 1.9% during restrictive conditions. Finally, the contribution of developed foreign markets to a U.S. equity portfolio is meager in both monetary environments, registering a return premium of only 0.17% (0.12%) during expansive (restrictive) monetary conditions.

In Table 6, we present correlations between the emerging countries and the World and U.S. index during both expansive and restrictive environments. There are 15 of 20 emerging countries where the correlation with the World index is lower in restrictive environments. The lower correlation in restrictive periods exists for 13 emerging countries relative to the U.S. index. Of the Latin American countries, only Mexico reports a higher correlation during restrictive periods. Also notable is how low the correlations are during restrictive environments. For both the World and U.S. index, the correlations are lower than 0.40 for 16 of the 20 countries.

Examining the equally-weighted, GDP-weighted, Latin American, and Asian indices, all have lower correlations with both the World and U.S. index during restrictive environments, compared to expansive environments. The lowest correlations with the developed market indices during restrictive environments are for the Latin American markets, where correlations are 0.24 and 0.23, about half that found in the Asian markets.[23] This is surprising, given the close

[23] If we omit Mexico from the Latin American index, the correlation between Latin America and the World index drops from 0.24 to 0.14, and the correlation with the U.S. drops from 0.23 to 0.13. A similar pattern is observed during expansive periods, although the correlation decline is not as dramatic. Absent Mexico, the correlation of

geographical proximity between the Latin American markets and the U.S., as well as the strong trade ties between the U.S. and Mexico and other Latin American countries.

As in Table 5, it is remarkable how the EAFEC compares to the broad emerging market indices. The correlation between the U.S. index and the equally-weighted, GDP-weighted, Latin American, and Asian indices are lower than that between the EAFEC and the U.S. index during both expansive and restrictive environments. The correlation between the Latin American markets and the U.S. is considerably less than half the 0.58 correlation between the EAFEC and the U.S. during restrictive environments.

In the next set of columns, we examine whether the diversification benefits of emerging markets during restrictive environments comes at the expense of a higher downside deviation. Examining the broad equally-weighted, GDP-weighted, Latin American, and Asian indices, the answer is a resounding no. For all four indices, the downside deviation is lower in restrictive environments, relative to expansive environments. For example, for the GDP-weighted emerging index the downside deviation is 4.41% during expansive conditions, but only 3.26% when conditions are restrictive. This relation also holds for 16 of the 20 individual emerging countries. In contrast, both the EAFEC and U.S. index have slightly higher downside deviations in restrictive environments.

Interestingly, during restrictive environments, both the equally-weighted and GDP-weighted emerging indices have a lower downside deviation than the EAFEC index. This finding strongly contradicts the accepted view that a foreign exposure via emerging markets entails considerably more risk than that from developed market equities. In expansive environments,

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Latin American markets and the World drops from 0.45 to 0.39, and the correlation with the U.S. drops from 0.41 to 0.35.

however, the traditional relation holds as all four broad emerging indices have higher downside deviations than the three developed market indices.

The last set of columns provides the Sortino ratios, combining downside deviation and excess returns. In 14 of the 20 emerging countries, the Sortino ratios are higher during restrictive environments, relative to expansive environments. For all but the Asian index, the broader emerging indices have higher Sortino ratios during restrictive environments. In both expansive and restrictive environments, the four broad emerging indices have higher Sortino ratios than the three developed markets. However, the magnitude of the differences is most pronounced during restrictive environments. At the extremes, the highest Sortino ratio is in Latin America at 0.52, versus 0.09 for the World index.

We next plot efficient frontiers of global portfolios to visually examine the marginal benefit from including emerging markets in a developed market portfolio. Figure 1 considers returns from the entire sample period and plots three alternative efficient frontiers.

The base case in Figure 1 is a frontier composed of U.S. and EAFEC equities and represents the return to developed market equities. Because these equities have very similar mean returns, similar standard deviations, and high correlations, the benefit to a U.S. investor from diversifying into the EAFEC is very modest. The frontier consists of a line that is more or less flat, representing limited potential for return enhancement. The line is also fairly short, representing limited risk reduction. The standard deviation for the minimum risk developed market portfolio is 4.20%, which is not a substantial improvement over the 4.43% standard deviation for the U.S. index.

The second frontier in Figure 1 considers the possible risk and return from investments in the U.S., EAFEC, and the equally-weighted emerging market indices. Perhaps most notable is

that an investment in emerging markets can result in *lower* risk for a developed market portfolio. The standard deviation for the minimum variance portfolio is 4.01% here, versus 4.20% for the base case, developed market portfolio. That an allocation to emerging markets can lower risk is likely contrary to most investors' perceptions. This 4.01% standard deviation is associated with a monthly return of 1.18%, which is a 21 basis point improvement over the 0.97% monthly return earned from the minimum variance developed market portfolio.

Comparing the two frontiers from another perspective, if an investor desired the 4.20% minimum standard deviation from developed equities, by adding emerging equities they could attain the desired standard deviation and also increase their return by a sizable amount. The incremental return at this level of risk is 37 basis points monthly (1.34%–0.97%) or 4.44% annually. Also surprising is that at this level of risk, the optimal allocation to emerging equities is quite high at approximately 56%, whereas the allocation to the EAFEC is surprisingly low at 4%. Most investors would probably view the former index as quite risky and the latter as less risky. Adding emerging markets also increases the potential return and expands the choice of risk-return levels, relative to the developed market indices. The frontier with the emerging market index included clearly dominates the frontier that includes only the developed market.

Our third frontier also adds emerging markets to the developed market equity indices but now allows the investor to partition the broad emerging index into two indices, the Asian index and the Latin American index. Relative to the broad emerging index that included all 20 markets, the minimum variance portfolio for this frontier has a 4.13% standard deviation, which is slightly higher than the 4.01% identified previously. Figure 1 also illustrates that the third frontier is dominated at low risk levels by the frontier allocated to the broad emerging index. Note that the broad emerging index also includes countries outside of Asia and Latin America.

However, the frontier with partitioned emerging investments still provides lower risk than that available from solely developed market indices. The 4.20% standard deviation of the minimum variance developed market portfolio results in a 1.24% return for the third frontier, which is a 27 basis point improvement over the developed market portfolio. Again the allocation to emerging markets is surprisingly high for these low risk portfolios, as Asia and Latin America constitute approximately 10% and 16% of the portfolio, respectively. The EAFEC and the U.S. provide 22% and 52%, respectively.

Most remarkable however are the expanded and increased return opportunities attained by partitioning the emerging market index. These opportunities result primarily from increased allocations to Latin American markets. The maximum return from the frontier inclusive of the broad emerging index was 1.62%. Using the third frontier, a 1.62% return is achieved by allocating approximately 5% to the EAFEC, 34% to the U.S., 19% to Asia, and 42% to Latin America. This is generated at a slightly lower risk level (5.00% versus 5.19%) than previously shown. It is striking again how little is allocated to the EAFEC and how much is allocated to emerging markets. In total, the latter figure is roughly 61%. Also striking is that the allocation to Latin America is twice that of emerging Asia. For higher return portfolios, the allocation to Latin America consistently increases and, being the highest mean return asset, eventually provides the entire allocation to highest return portfolio.

The strong allocation to Latin America is not solely a function of its return however. Recall from the discussion above that the correlation between Latin American equities and the World index was 0.37, which was lower than the 0.54 for Asia. Despite the fact that the standard deviation for the Latin American markets was higher than for the Asian markets (7.98% versus 6.62%), Latin American markets are more heavily weighted at all levels of return and risk on the

efficient frontier. In fact, the average allocation to Latin America is 48% versus 17% to Asia, 8% to the EAFEC, and 27% to the U.S. These results indicate that investment advisors should consider emerging markets as heterogeneous investments and should consider the investment benefits offered by each region. The results provided here demonstrate that the returns, currency effects, standard deviations, and correlations can differ substantially. This results in diverse and surprisingly large allocations to emerging markets and to specific regions.

In Figure 2 we examine the marginal benefit from adding emerging markets to a portfolio over restrictive and expansive U.S. monetary environments. In this figure, emerging markets are represented by the Asian index and the Latin American index. Examining the developed markets first (the base case frontiers), we confirm the results of Conover, Jensen, Johnson, and Mercer (2005) showing that the risk/return tradeoff for developed market equities is more favorable during expansive environments. As in Figure 1, the diversification benefit from combining U.S. and EAFEC stocks is limited, due to their high correlation and similar risk and return. The developed market frontiers thus plot virtually as lines that are relatively flat during both restrictive and expansive environments.

The effect on the frontiers from adding emerging equities is remarkable. In both restrictive and expansive environments, the addition of emerging markets results in dominant portfolios that allow for lower risk, higher returns, and expanded risk/return possibilities. As illustrated in Figure 2, the marginal benefit from adding emerging equities is heightened during restrictive periods. The developed market investor starts from a weakened position during restrictive periods. But when emerging equities are added, the risk/return tradeoff quickly becomes more favorable during restrictive periods, relative to expansive periods.

As in Figure 1, the addition of emerging equities actually provides the investor with the ability to lower risk, especially during restrictive periods. Although the addition of emerging market equities during expansive periods reduces the standard deviation for the minimum risk portfolio by a trivial amount, 4.35% to 4.34%, during restrictive periods, the corresponding reduction is a more prominent 3.99% to 3.78%. Viewing the minimum variance portfolio from a return perspective, adding emerging markets adds 58 (10) basis points in monthly return during restrictive (expansive) environments, respectively, while still maintaining risk at the 4.35% (3.99%) standard deviation level.

These results indicate that emerging equities provide diversification benefits to developed market portfolios, but that the primary marginal benefit occurs during restrictive monetary periods. The benefits can be attributed to the relatively strong performance of emerging market equities during restrictive monetary periods, which are associated with poor performance for developed market equities. Latin American equities are particularly beneficial during restrictive periods due to their extremely low correlations and relatively strong returns.

As in Figure 1, the allocation to Latin American markets is very high as the average allocation is 56% for the restrictive frontier and 45% for the expansive frontier. Using the same framework, the average allocation to Asian markets is 18% and 20%. Again the allocation to EAFEC equities is surprisingly low, at 6% during both periods. For the U.S., the average allocation is, as expected, higher during expansive periods at 29% versus 19% in restrictive periods.

Figures 1 and 2 illustrate the large benefits emerging market equities offer to developed market equity investors. It is worth noting, however, that the mean-variance efficient frontiers may understate the magnitude of the potential benefits available from emerging market equities.

In particular, the evidence reported in Tables 3 and 6 indicate that a substantial portion of the variation in emerging market returns is due to upside variation, which is not harmful to investors. Downside variation as a percent of total variation is substantially smaller for emerging market equities relative to developed market equities.

Conclusions

Using over three decades of data for 20 emerging countries, we find that the majority of emerging markets provide the investor with higher U.S. dollar returns than that available from developed market indices. This result is attained despite pervasive losses from currency effects. Although emerging markets have high stand-alone risk, their modest contribution from currency risk along with their low correlations with developed markets make them a beneficial addition to a developed market portfolio. Surprisingly, from a U.S. investor's perspective, Latin American equities represent a far superior portfolio addition relative to an EAFEC or a broad emerging market investment. The Latin American markets provide a return premium that is nearly ten times the premium offered by the EAFEC and is over twice that offered by the GDP-weighted emerging index.

When we reexamine the performance of emerging markets using measures that account for asymmetric distributions, we find that interestingly, broad emerging market indices have downside risk that is similar to that in developed markets. Furthermore, the Sortino ratio for the equally-weighted emerging index is more than twice that available from developed market indices. Thus, we conclude that the high risk commonly attributed to emerging markets comes in the form of upside variation, which should be of relatively little concern to investors.

We next use a measure of U.S. financial market conditions that is available to investors on an ex-ante basis. We find that emerging markets are particularly valuable to the developed-

market investor during periods of heightened inflationary concerns. Latin American markets are particularly impressive as a diversifier, offering higher Sharpe and Sortino ratios, and lower correlations than that available from an EAFEC or emerging Asian market investment. The benefits of Latin American markets are especially prominent when inflationary pressures are heightened. Based on this evidence, we argue that the superior investment benefits offered by the Latin American index may be attributed to the relatively heavy reliance Latin American companies place on commodities as exports.

To evaluate the implications that emerging markets have for portfolio performance, we generate alternative efficient frontiers from the equity indices. In general, we find that emerging markets allow investors to achieve lower risk and vastly expanded risk/return possibilities relative to what is available from developed market portfolios. Latin American markets consistently receive the largest allocation in the efficient frontiers formed from the alternative equity indices. Finally, we confirm that the benefits of investing in emerging markets, and especially Latin America, are greatly expanded when U.S. inflationary concerns are elevated; it is during such periods that developed market investors need diversification the most.

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Table 1
Risk and Return for Emerging Markets in U.S. Dollars (USD) and Local Currency (LC) from 1976-2010

	Number of Monthly Observations	USD Geometric Mean Return	LC Geometric Mean Return	Currency Effect	USD Standard Deviation	LC Standard Deviation	Contribution of Currency Risk
Argentina	420	1.43%	7.03%	-5.61%	22.36%	31.49%	-9.12%
Brazil	420	1.05%	7.74%	-6.69%	14.70%	19.35%	-4.65%
Chile	420	1.77%	2.75%	-0.97%	9.38%	8.95%	0.43%
Colombia	312	1.84%	2.77%	-0.93%	8.87%	8.26%	0.62%
Greece	420	0.27%	0.73%	-0.46%	9.94%	9.53%	0.41%
India	420	1.13%	1.51%	-0.39%	8.40%	8.15%	0.25%
Indonesia	252	0.36%	1.00%	-0.64%	12.85%	9.90%	2.95%
Jordan	395	0.85%	1.06%	-0.21%	5.74%	5.67%	0.07%
Korea	420	0.96%	1.16%	-0.21%	10.74%	9.42%	1.32%
Malaysia	312	0.61%	0.68%	-0.08%	8.84%	7.98%	0.87%
Mexico	420	1.21%	2.88%	-1.67%	11.01%	10.00%	1.00%
Nigeria	312	0.84%	2.54%	-1.71%	12.27%	7.26%	5.00%
Pakistan	312	0.88%	1.44%	-0.56%	9.89%	9.61%	0.28%
Philippines	312	1.29%	1.55%	-0.26%	9.80%	9.25%	0.55%
Portugal	420	-0.40%	-0.45%	0.05%	4.64%	4.12%	0.52%
Taiwan	312	0.89%	0.80%	0.10%	11.68%	11.16%	0.53%
Thailand	420	0.89%	0.99%	-0.09%	9.89%	9.26%	0.63%
Turkey	288	1.31%	4.02%	-2.71%	17.84%	17.14%	0.70%
Venezuela	264	0.90%	3.28%	-2.37%	13.82%	11.66%	2.16%
Zimbabwe	372	0.34%	4.40%	-4.06%	19.77%	19.80%	-0.03%
Equal-weight Emerging index	420	1.48%	3.02%	-1.54%	5.19%	4.97%	0.22%
GDP-weight Emerging index	420	1.36%	3.44%	-2.08%	6.19%	6.41%	-0.21%
Latin America	420	1.99%	5.36%	-3.38%	7.98%	9.12%	-1.14%
Asia	420	1.23%	1.43%	-0.20%	6.62%	5.79%	0.83%
MSCI EAFEC	420	0.86%	0.72%	0.14%	4.93%	4.18%	0.75%
MSCI USA	420	0.87%	0.87%	0.00%	4.43%	4.43%	0.00%
MSCI WORLD	420	0.84%	0.77%	0.07%	4.30%	4.02%	0.28%

Table 2

Performance Statistics for Emerging Markets in U.S. Dollars from 1976-2010

	Sharpe Ratio	Comparison Statistic	Return Premium Relative to MSCI World	Return Premium Relative to MSCI USA
Argentina	0.14*	0.01	2.73%	2.70%
Brazil	0.11*	0.04	1.15%	1.21%
Chile	0.19*	0.03	1.50%	1.52%
Colombia	0.20*	0.03	1.49%	1.51%
Greece	0.03	0.04	-0.13%	-0.06%
India	0.12*	0.03	0.76%	0.80%
Indonesia	0.06	0.05	0.11%	0.13%
Jordan	0.10	0.02	0.45%	0.48%
Korea	0.10*	0.05	0.53%	0.61%
Malaysia	0.06	0.05	0.12%	0.11%
Mexico	0.13*	0.05	0.91%	0.89%
Nigeria	0.10	0.02	0.99%	1.04%
Pakistan	0.09	0.01	0.80%	0.80%
Philippines	0.13*	0.05	0.83%	0.87%
Portugal	-0.16*	0.05	-0.98%	-0.89%
Taiwan	0.09	0.04	0.59%	0.65%
Thailand	0.09	0.04	0.50%	0.54%
Turkey	0.13*	0.04	1.65%	1.71%
Venezuela	0.10	0.01	1.29%	1.28%
Zimbabwe	0.12*	0.00	2.41%	2.47%

Equally-weight Emerging index	0.23*	0.06	0.84%	0.88%
GDP-weight Emerging index	0.18*	0.06	0.71%	0.74%
Latin America	0.23*	0.04	1.51%	1.53%
Asia	0.15*	0.06	0.60%	0.65%
MSCI EAFEC	0.11*	0.11	0.01%	0.16%
MSCI USA	0.12*	0.10	0.09%	-
MSCI WORLD	0.11*	-	-	0.05%

* indicates significantly different from zero at a 5% significance level or less.

The comparison statistic is the product of the World index Sharpe ratio and the correlation between the asset and the World index.

Table 3
Performance Statistics for Emerging Markets in US Dollars from 1976-2010

	Correlation with MSCI World	Correlation with MSCI USA	Excess Return	Downside Deviation	Sortino Ratio
Argentina	0.12	0.13	3.04%	10.74%	0.28
Brazil	0.31	0.27	1.67%	8.98%	0.19
Chile	0.23	0.20	1.74%	5.21%	0.33
Colombia	0.28	0.25	1.87%	4.92%	0.38
Greece	0.37	0.30	0.30%	6.20%	0.05
India	0.27	0.22	1.03%	5.21%	0.20
Indonesia	0.43	0.40	0.89%	8.56%	0.10
Jordan	0.18	0.13	0.56%	3.33%	0.17
Korea	0.43	0.35	1.06%	6.24%	0.17
Malaysia	0.42	0.42	0.64%	5.79%	0.11
Mexico	0.41	0.41	1.42%	7.74%	0.18
Nigeria	0.15	0.10	1.30%	7.75%	0.17
Pakistan	0.13	0.11	1.04%	6.36%	0.16
Philippines	0.42	0.38	1.41%	5.83%	0.24
Portugal	0.46	0.29	-0.74%	3.78%	-0.19
Taiwan	0.39	0.33	1.20%	7.02%	0.17
Thailand	0.39	0.33	0.93%	6.42%	0.15
Turkey	0.34	0.30	2.47%	10.03%	0.25
Venezuela	0.08	0.08	1.47%	8.57%	0.17
Zimbabwe	0.03	0.00	2.43%	11.38%	0.21
Equally-weight Emerging index	0.56	0.48	1.17%	3.29%	0.36
GDP-weight Emerging index	0.56	0.50	1.11%	3.96%	0.28
Latin America	0.37	0.35	1.85%	4.61%	0.40
Asia	0.54	0.46	1.00%	4.35%	0.23
MSCI EAFEC	0.93	0.64	0.53%	3.40%	0.16
MSCI USA	0.87	1.00	0.53%	3.05%	0.17
MSCI WORLD	1.00	0.87	0.49%	3.00%	0.16

Table 4

Correlations Between Emerging Market Returns (LC) and U.S. and Developed World Inflation

Price Level Proxies		Regional Emerging Markets Indices	
Inflation Rate Indices	Equally-weighted Emerging index	Latin America	Asia
U.S. Consumer Price Index	0.11*	0.21*	-0.01
U.S. Consumer Price Index - Core Inflation	0.07	0.27*	0.00
Europe Consumer Price Index	0.02	0.30*	-0.08
Advanced Industrial Country Consumer Price Index	0.02	0.25*	-0.01
World Consumer Price Index	0.28*	0.56*	0.07

* indicates significantly different from zero at a 5% significance level or less.

The Europe Consumer Price Index is provided by the OECD and is for all OECD countries in Europe. The Advanced Industrial Country Consumer Price Index and the World Consumer Price Index are provided by the IMF.

Table 5

Performance Statistics for Emerging Markets across Monetary Environments

	Panel A. Expansive Monetary Conditions					Panel B. Restrictive Monetary Conditions			
	Excess Return	Sharpe Ratio	Return Premium Relative to MSCI World	Return Premium Relative to MSCI USA		Excess Return	Sharpe Ratio	Return Premium Relative to MSCI World	Return Premium Relative to MSCI USA
Argentina	2.72%	0.12	2.14%	2.20%		3.49%	0.15*	3.41%	3.33%
Brazil	1.33%	0.09	0.50%	0.54%		2.13%	0.15*	1.92%	1.99%
Chile	1.87%	0.19*	1.43%	1.51%		1.58%	0.17*	1.52%	1.49%
Colombia	2.43%	0.25*	1.91%	1.94%		1.03%	0.11	0.80%	0.81%
Greece	0.68%	0.07	0.00%	0.10%		-0.23%	-0.02	-0.38%	-0.35%
India	1.01%	0.11	0.56%	0.61%		1.04%	0.15*	0.97%	0.99%
Indonesia	0.66%	0.04	-0.42%	-0.29%		1.27%	0.12	0.84%	0.76%
Jordan	0.51%	0.10	0.36%	0.42%		0.63%	0.10	0.56%	0.56%
Korea	1.05%	0.09	0.28%	0.39%		1.06%	0.11	0.82%	0.84%
Malaysia	0.63%	0.06	0.03%	0.03%		0.66%	0.08	0.27%	0.23%
Mexico	1.44%	0.13*	0.80%	0.79%		1.41%	0.13	1.10%	1.04%
Nigeria	0.71%	0.05	0.22%	0.37%		2.18%	0.21*	2.05%	2.02%
Pakistan	1.21%	0.10	0.99%	0.96%		0.78%	0.09	0.54%	0.57%
Philippines	1.84%	0.16*	1.11%	1.21%		0.74%	0.08	0.37%	0.34%

Portugal	-1.08%	-0.22	-1.46%	-1.36%		-0.27%	-0.07	-0.37%	-0.31%
Taiwan	1.56%	0.13	0.75%	0.91%		0.66%	0.04	0.29%	0.25%
Thailand	1.32%	0.12	0.73%	0.82%		0.41%	0.05	0.18%	0.17%
Turkey	1.77%	0.09	0.51%	0.54%		3.39%	0.19*	3.02%	3.10%
Venezuela	0.68%	0.05	0.18%	0.23%		2.60%	0.17	2.63%	2.61%
Zimbabwe	1.41%	0.08	1.29%	1.36%		3.75%	0.18*	3.79%	3.83%
Equal-weight Emerging index	1.10%	0.20*	0.58%	0.65%		1.27%	0.28*	1.13%	1.14%
GDP-weight Emerging index	1.05%	0.16*	0.42%	0.47%		1.18%	0.21*	1.03%	1.03%
Latin America	1.73%	0.21*	1.17%	1.22%		2.02%	0.28*	1.90%	1.89%
Asia	1.18%	0.16*	0.58%	0.68%		0.76%	0.13	0.58%	0.58%
MSCI EAFEC	0.67%	0.13*	-0.02%	0.17%		0.33%	0.07	0.04%	0.12%
MSCI USA	0.67%	0.15*	0.08%	-		0.33%	0.08	0.09%	-
MSCI WORLD	0.65%	0.15*	-	0.07%		0.27%	0.07	-	0.01%

* indicates significantly different from zero at a 5% significance level or less.

Table 6

Performance Statistics for Emerging Markets in U.S. Dollars by U.S. Monetary Environment

	Panel A. Expansive Environments					Panel B. Restrictive Environments			
	Correlation with MSCI World	Correlation with MSCI USA	Downside Deviation	Sortino Ratio		Correlation with MSCI World	Correlation with MSCI USA	Downside Deviation	Sortino Ratio
Argentina	0.18	0.16	10.61%	0.26		0.05	0.09	10.91%	0.32
Brazil	0.38	0.36	9.22%	0.14		0.22	0.13	8.64%	0.25
Chile	0.31	0.25	5.58%	0.33		0.10	0.13	4.67%	0.34
Colombia	0.32	0.30	4.93%	0.49		0.19	0.15	4.89%	0.21
Greece	0.46	0.40	6.32%	0.11		0.24	0.16	6.03%	-0.04
India	0.33	0.29	5.79%	0.17		0.17	0.09	4.28%	0.24
Indonesia	0.45	0.39	9.82%	0.07		0.39	0.45	6.02%	0.21
Jordan	0.20	0.12	3.20%	0.16		0.16	0.15	3.49%	0.18
Korea	0.46	0.39	6.64%	0.16		0.37	0.29	5.66%	0.19
Malaysia	0.36	0.36	6.26%	0.10		0.58	0.57	4.98%	0.13
Mexico	0.40	0.40	7.49%	0.19		0.42	0.43	8.07%	0.17
Nigeria	0.21	0.14	8.13%	0.09		-0.01	0.03	7.14%	0.30
Pakistan	0.09	0.10	7.32%	0.16		0.23	0.15	4.54%	0.17
Philippines	0.41	0.35	5.92%	0.31		0.45	0.44	5.68%	0.13

Portugal	0.52	0.38	4.28%	-0.25		0.37	0.13	2.98%	-0.09
Taiwan	0.44	0.35	5.88%	0.27		0.30	0.30	8.45%	0.08
Thailand	0.38	0.32	6.71%	0.20		0.40	0.36	6.00%	0.07
Turkey	0.43	0.41	10.82%	0.16		0.21	0.12	8.89%	0.38
Venezuela	0.24	0.22	8.87%	0.08		-0.12	-0.09	8.13%	0.32
Zimbabwe	0.06	0.03	11.90%	0.12		0.00	-0.03	10.67%	0.35
Equally-weight Emerging index	0.64	0.54	3.70%	0.30		0.44	0.36	2.63%	0.48
GDP-weight Emerging index	0.65	0.59	4.41%	0.24		0.42	0.35	3.26%	0.36
Latin America	0.45	0.41	5.07%	0.34		0.24	0.23	3.88%	0.52
Asia	0.56	0.47	4.62%	0.26		0.49	0.43	3.95%	0.19
MSCI EAFEC	0.93	0.67	3.38%	0.20		0.93	0.58	3.43%	0.10
MSCI USA	0.89	1.00	3.00%	0.22		0.83	1.00	3.11%	0.11
MSCI WORLD	1.00	0.89	3.01%	0.22		1.00	0.83	3.00%	0.09

Figure 1: Efficient Frontiers Including and Excluding Emerging Markets

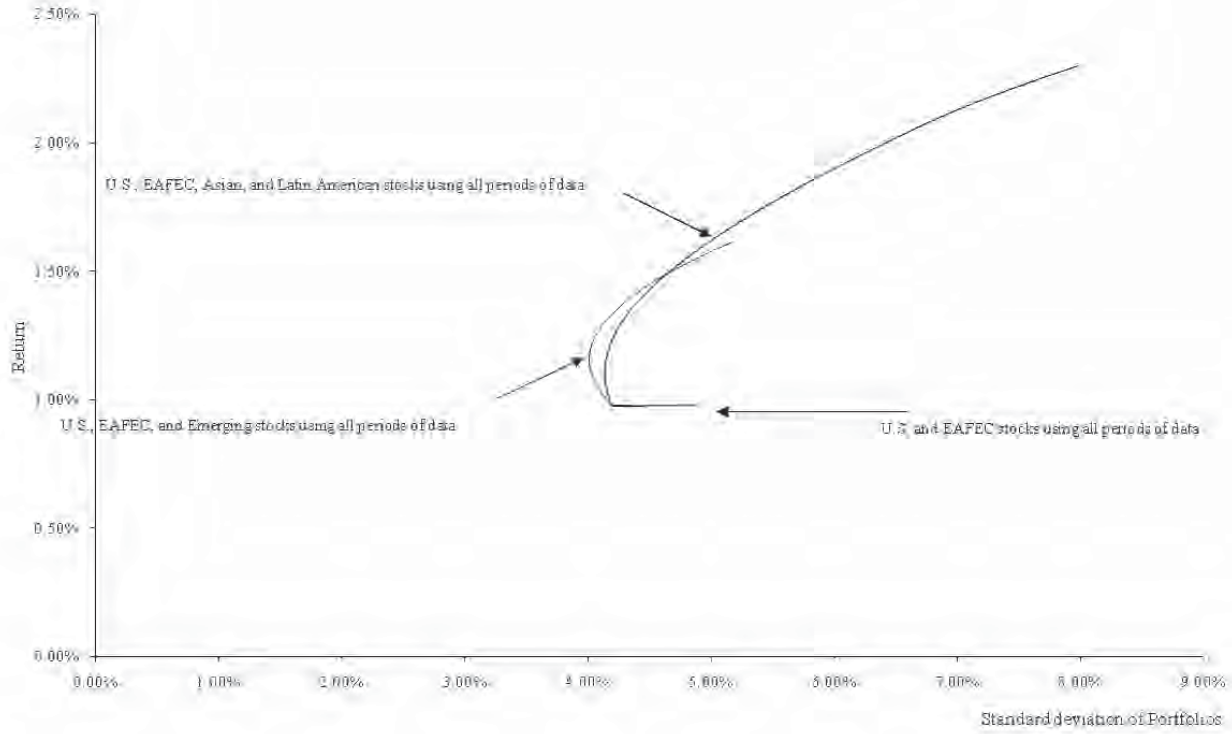
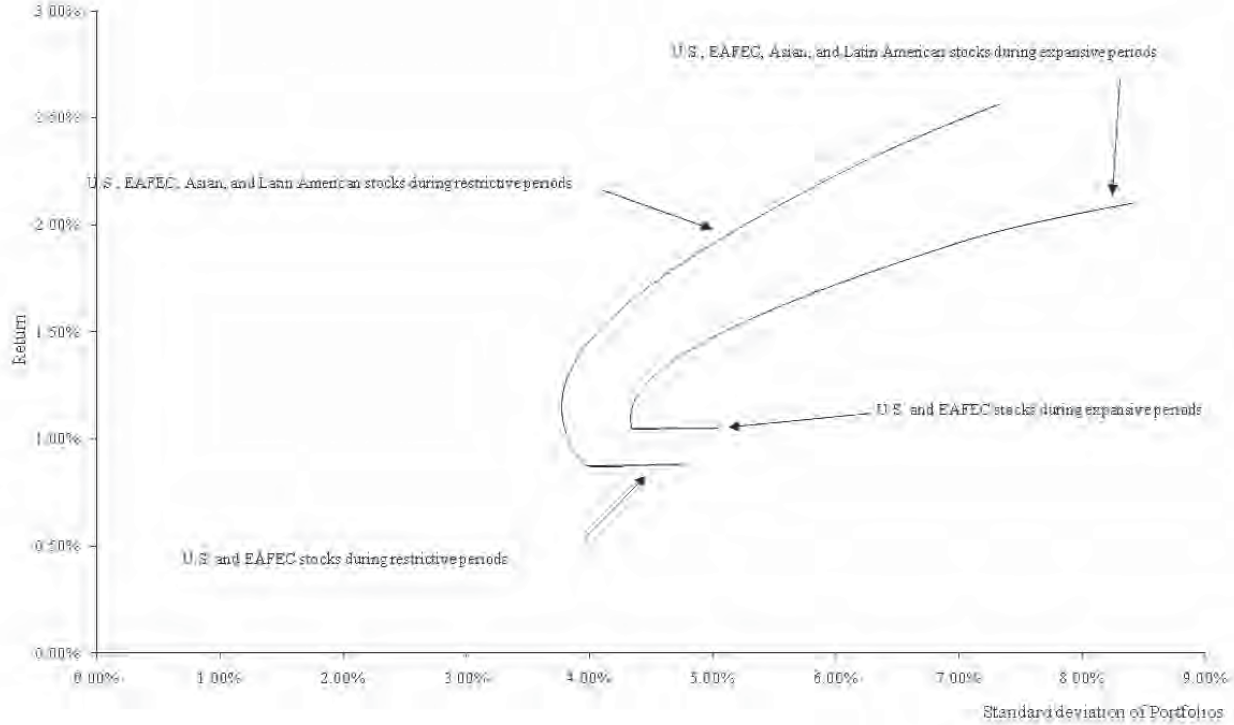


Figure 2: Efficient Frontiers by Monetary Environment



Appendix

Average Weights for Emerging Markets in the GDP-Weighted Index

Argentina	5.8%
Brazil	17.3%
Chile	1.7%
Colombia	2.3%
Greece	3.7%
India	13.1%
Indonesia	5.2%
Jordan	0.2%
Korea, Rep.	9.7%
Malaysia	2.1%
Mexico	12.0%
Nigeria	2.0%
Pakistan	1.8%
Philippines	2.0%
Portugal	2.8%
Taiwan	5.3%
Thailand	3.1%
Turkey	6.0%
Venezuela	3.2%
Zimbabwe	0.3%